



## UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,236	10/28/2003	Thomas Lloyd Credelle	AB-2913-1P US	5279
32605	7590	08/18/2009	EXAMINER	
Haynes and Boone, LLP IP Section 2323 Victory Avenue SUITE 700 Dallas, TX 75219			MOON, SEOKYUN	
ART UNIT	PAPER NUMBER		2629	
MAIL DATE	DELIVERY MODE			
08/18/2009	PAPER			

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/696,236	<b>Applicant(s)</b> CREDELLE, THOMAS LLOYD
	<b>Examiner</b> SEOKYUN MOON	<b>Art Unit</b> 2629

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If no period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 04 May 2009.  
 2a) This action is FINAL.      2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-5,8-21,25,26 and 28-31 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-5,8-21,25,26 and 28-31 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 16 March 2007 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date: _____
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)	5) <input type="checkbox"/> Notice of Informal Patent Application
Paper No(s)/Mail Date: _____	6) <input type="checkbox"/> Other: _____

**DETAILED ACTION**

***Response to Arguments***

1. The Applicant's arguments with respect to the claim limitation which is newly added to the independent claim 1 have been considered but are moot in view of the new ground(s) of rejection.

The Applicant's arguments with respect to the claim limitation "*repeating group*" [Remarks: pg 11 last paragraph] have been fully considered but they are not persuasive.

The Applicant argues, "*Applicant respectfully submits that a person skilled in the art cannot reasonably view Mori Fig. 15 as showing an even number of subpixels in the row of the repeating group. The 'One Pixel' of Mori Fig. 15 is a repeating group and it has an odd number of subpixels.*". However, Examiner respectfully submits that none of the limitation of the claims requires Examiner to interpret only one pixel of Mori as the claimed repeating group. Since groups of pixels are repeated in the device of Mori, it would be reasonable to one of ordinary skilled in the art to construe each of the groups of pixels as the claimed repeating group [drawing 1 provided on page 3 of this Office action, which is same as figure 15 of Mori] (As shown below, in the device of Mori, there are a plurality of repeated groups each of which comprises four pixels).

G	B	G	G	B	G	G	B	G
R	B	R	R	B	R	R	B	R
G	B	G	G	B	G	G	B	G
R	B	R	R	B	R	R	B	R
G	B	G	G	B	G	G	B	G
R	B	R	R	B	R	R	B	R

sub-pixel repeating group

Drawing 1

The Applicant's arguments with respect to the objection to the specification [Remarks: pg 12 1<sup>st</sup> paragraph] have been fully considered. However, Examiner respectfully submits that the Applicant's explanation disclosed in the arguments regarding the objection to the specification is merely about how the loss of luminance is localized in the blue subpixels, but is not about how the loss of luminance is occurred. Based on the detailed explanation provided throughout the Applicant's Remarks, it appears that the cause of the loss of luminance, i.e. the cause of the image degradation, in the instant invention is having two subpixels violating the rule of one dot inversion, i.e. two subpixels having same polarity. Since Examiner believes that the explanation in the specification is sufficient to support such subject matter, the objection to the specification is withdrawn in this correspondence. However, Examiner respectfully advises the Applicant that if the cause of the image degradation in the instant invention is not just having two subpixels violating the rule of one dot inversion, i.e. two subpixels having same polarity, but is something different, it is required for the Applicant to indicate which part of the specification and the drawings of the instant Application discloses or shows such different subject matter. -

***Drawings***

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the claim limitation, "...  
*potential image degradation introduced by said violation of the periodic dot inversion polarity scheme is localized on said one or more of the columns of first colored subpixels*" disclosed in claim 1 must be shown or the feature(s) canceled from the claim (For example, figures 3, 5, and 6 show the image degradation being localized in the two adjacent columns of two different colored subpixels. Furthermore, the Applicant indicated, "*where the violation occurs as between a Blue subpixel and another subpixel*" on page 10 2<sup>nd</sup> paragraph of the Applicant's Remarks.). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New

Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. **Claims 1-5, 8-14, 20-21, 25-26, and 28** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

As to **claim 1**, the claim discloses, "*a driver circuit sending to the panel, image signals representing image data where the driver circuit uses a substantially periodic dot inversion polarity scheme*" and "*wherein said driver circuit selectively violates the dot inversion polarity scheme at one or more of the columns of first colored subpixels such that...*". However, Examiner respectfully submits that once the driver circuit violates the dot inversion scheme, then the inversion scheme is no longer the dot inversion scheme. Furthermore, as clearly shown on figure 3 of the current Application, the panel of the current invention is driven by two different dot inversions. For example, the part of the panel driven under "driver chip 301B" is driven by two dot inversion while the part

of the panel driven under "*driver chip 301C*" is driven by one dot inversion. The circled "*subpixels 302*" having same polarity is merely caused by the above two different dot inversions, but is not caused by violating one of the above dot inversions. In fact, since the panel of the instant invention is always driven by the two different dot inversions, the panel always violates the rules of the one of the two different dot inversions. In other words, since the part of the panel driven under "*driver chip 301B*" is driven by two dot inversion while the part of the panel driven under "*driver chip 301C*" is driven by one dot inversion, the part of the panel driven under "*driver chip 301B*" always violates the rule of one dot inversion. For further examination purpose, the above claim limitation will be interpreted as, "*a driver circuit sending to the panel, image signals representing image data where the driver circuit uses a substantially periodic non-dot inversion polarity scheme*" and "*wherein said driver circuit selectively violates a dot inversion polarity scheme at one or more of the columns of first colored subpixels such that...*", as best understood by Examiner. Appropriate explanation/correction is required.

As to **claims 2-5 and 28**, the claims are rejected as being dependent upon the base claim rejected under 35 U.S.C. 112, first paragraph.

As to **claim 8**, the claim discloses, "*providing driver signals to the subpixels in the panel where the driver signals define image data having a substantially periodic dot inversion polarity scheme applied thereto, wherein the providing of the driver signals selectively violates the dot inversion polarity scheme*". For the similar reasons disclosed in the rejection of claim 1 under 35 U.S.C. 112, first paragraph, the above claim limitation will be interpreted as, "*a driver circuit sending to the panel, image signals*

*representing image data where the driver circuit uses a substantially periodic non-dot inversion polarity scheme" and "wherein said driver circuit selectively violates a periodic dot inversion polarity scheme at one or more of the columns of first colored subpixels such that...", as best understood by Examiner.* Appropriate correction/explanation is required.

As to **claims 9-12**, the claims are rejected as being dependent upon the base claim rejected under 35 U.S.C. 112, first paragraph.

As to **claim 13**, the claim discloses, "*A method of providing a substantially periodic dot inversion polarity scheme" and "providing signals for image data having a substantially periodic dot inversion polarity scheme to the panel with use of a driver circuit outputting at least two phases where each of the phases periodically violates the dot inversion polarity scheme".* For the similar reasons disclosed in the rejection of claims 1 and 8 under 35 U.S.C. 112, first paragraph, the above claim limitation will be interpreted as, "*A method of providing a substantially periodic non-dot inversion polarity scheme" and "providing signals for image data having a substantially periodic non-dot inversion polarity scheme to the panel with use of a driver circuit outputting at least two phases where each of the phases periodically violates a periodic dot inversion polarity scheme*". The claim further discloses, "... it primarily impacts the at least one column of blue subpixels". However, as shown on figure 3 of the instant Application and as admitted by the Applicant [Remarks: pg 10 2<sup>nd</sup> paragraph], the violation of a periodic dot inversion polarity scheme not only impacts the blue subpixels, but also green subpixels. Examiner respectfully submits that the degree of the image degradation caused by the

green subpixels might be less than the degree of the image degradation caused by the blue subpixels, but the impact of the violation on both of the subpixels are same. Appropriate correction/explanation is required.

As to **claims 14 and 25**, the claims are rejected as being dependent upon the base claim rejected under 35 U.S.C. 112, first paragraph.

As to **claim 20**, the claim discloses "*driving means for providing signals for image data having a dot inversion polarity scheme to the display means; said driving means having at least two phases selected such that each of the phases periodically violates the dot inversion polarity scheme..*". For the similar reasons disclosed in the rejection of claims 1, 8, and 13 under 35 U.S.C. 112, first paragraph, the above claim limitation will be interpreted as, "*driving means for providing signals for image data having a non-dot inversion polarity scheme to the display means; said driving means having at least two phases selected such that each of the phases periodically violates a dot inversion polarity scheme..*", as best understood by Examiner. Appropriate correction/explanation is required.

As to **claims 21 and 26**, the claims are rejected as being dependent upon the base claim rejected under 35 U.S.C. 112, first paragraph.

#### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 1-2, 8-9, 13-16, 19-21, 25-26, and 28-31** are rejected under 35 U.S.C. 103(a) as being unpatentable over Mori (US 6,326,981).

As to **claim 1**, Mori teaches a liquid crystal display [abstract lines 1-2] comprising:

a panel [fig. 4, col. 4 lines 1-2, and drawing 1 provided on page 3 of this Office Action] substantially tessellated by a sub-pixel repeating group comprising differently colored and individually addressable sub-pixels and having an even number of individually addressable sub-pixels in a row [drawing 1], the sub-pixel repeating group further comprising a column of first colored sub-pixels (the two blue sub-pixels arranged in one column of the sub-pixel repeating group as shown on drawing 1), where the color of the first colored subpixels (the two blue sub-pixels arranged in one column of the sub-pixel repeating group as shown on drawing 1) is one to which the human visual system has lower luminance change sensitivity than to other colors of other colored ones of the subpixels in the subpixel repeating group; and

a driver circuit sending to the panel, image signals representing image data [col. 1 lines 47-52 and col. 12 lines 12-17].

Mori does not teach that the driver circuit uses a substantially periodic non-dot inversion polarity scheme and selectively violates a periodic dot inversion scheme at one or more of the columns of first colored subpixels such that potential image degradation introduced by the violation of the periodic dot inversion polarity scheme is localized on the one or more of the columns of first colored subpixels.

However, Examiner takes Official Notice that it is well known in the art to use a periodic 2-line inversion polarity scheme as a driving method of a liquid crystal display.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the driver circuit of Mori to use a periodic two-line inversion polarity scheme in order to reduce vertical crosstalk caused by having a plurality of pixels/sub-pixels driven by the same polarity.

Mori as modified above teaches that the driver circuit selectively violates a periodic dot inversion polarity scheme (Note that any two-line inversion polarity scheme violates the rules of any one-dot inversion polarity scheme) at one or more of the columns of first colored subpixels (the blue subpixels included in the rectangular boxes) [drawing 2 provided below, which is same as figure 15 of Mori with the two-line inversion polarity scheme] such that potential image degradation introduced by the violation of the periodic dot inversion polarity scheme (by having two same colored subpixels having the same polarity in one column, the vertical crosstalk still occurs and the image degradation of blue colors caused by the vertical crosstalk occurs) is localized on the one or more of the columns of the first colored subpixels.

G B G G B G  
R B R R B R  
Drawing 2      G B G G B G  
R B R R B R  
G B G G B G  
R B R R B R

As to **claim 2**, Mori teaches the first colored sub-pixels being blue colored sub-pixels (as discussed with respect to the rejection of claim 1).

As to **claim 8**, Mori teaches a method of driving a liquid crystal display having a panel [fig. 4, col. 4 lines 1-2, and drawing 1 provided on page 3 of this Office Action] that is substantially tessellated by a sub-pixel repeating group comprising differently colored and individually addressable sub-pixels and having an even number of individually addressable sub-pixels in a row [drawing 1], the sub-pixel repeating group further comprising a column of first colored sub-pixels (the two blue sub-pixels arranged in one column of the sub-pixel repeating group as shown on drawing 1), where the color of the first colored subpixels (the two blue sub-pixels arranged in one column of the sub-pixel repeating group as shown on drawing 1) is one to which the human visual system has lower luminance change sensitivity than to other colors of other colored ones of the subpixels in the subpixel repeating group; the method comprising:

providing driving signals to the subpixels in the panel where the driver signals define image data [col. 1 lines 47-52 and col. 12 lines 12-17].

Mori does not teach that the driver signals define image data having a substantially periodic non-dot inversion polarity scheme applied thereto, wherein the providing of the driver signals selectively violates a periodic dot inversion scheme at one or more of the columns of first colored subpixels such that potential image degradation introduced by the violation of the periodic dot inversion polarity scheme is localized on the one or more of the columns of first colored subpixels.

However, Examiner takes Official Notice that it is well known in the art to use a periodic 2-line inversion polarity scheme as a driving method of a liquid crystal display.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mori to use a periodic two-line inversion polarity scheme in order to reduce vertical crosstalk caused by having a plurality of pixels/sub-pixels driven by the same polarity.

Mori as modified above teaches that the providing of the driver signals selectively violates a periodic dot inversion polarity scheme (Note that any two-line inversion polarity scheme violates the rules of any one-dot inversion polarity scheme) at one or more of the columns of first colored subpixels (the blue subpixels included in the rectangular boxes) [drawing 2 provided on page 10 of this Office action, which is same as figure 15 of Mori with the two-line inversion polarity scheme] such that potential image degradation introduced by the violation of the periodic dot inversion polarity scheme (by having two same colored subpixels having the same polarity in one column, the vertical crosstalk still occurs and the image degradation of blue colors caused by the vertical crosstalk occurs) is localized on the one or more of the columns of the first colored subpixels.

As to **claim 9**, Mori teaches the column of first colored sub-pixels being the column of blue sub-pixels [drawing 2 provided on page 10 of this Office Action].

As to **claim 13**, Mori teaches a method of driving a liquid crystal display having a panel [fig. 4, col. 4 lines 1-2, and drawing 1 provided on page 3 of this Office Action] that is substantially tessellated by a sub-pixel repeating group comprising differently colored

and individually addressable sub-pixels and having an even number of individually addressable sub-pixels in a row [drawing 1], the sub-pixel repeating group further comprising at least one column of blue sub-pixels (the two blue sub-pixels arranged in one column of the sub-pixel repeating group as shown on drawing 1); and the method comprising:

providing signals for image data [col. 1 lines 47-52 and col. 12 lines 12-17].

Mori does not teach the method comprising providing signals for image data having a substantially periodic non-dot inversion polarity scheme to the panel with use of a driver circuit outputting at least two phases where each of the phases periodically violates the dot inversion polarity scheme and the point of violation is selected such that it primarily impacts the at least one column of blue subpixels.

However, Examiner takes Official Notice that it is well known in the art to use a periodic 2-line inversion polarity scheme as a driving method of a liquid crystal display.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mori to use a periodic two-line inversion polarity scheme in order to reduce vertical crosstalk caused by having a plurality of pixels/sub-pixels driven by the same polarity.

Mori as modified above teaches the method comprising providing signals for image data having a substantially periodic non-dot inversion polarity scheme (Note that any two-line inversion polarity scheme violates the rules of any one-dot inversion polarity scheme) to the panel with use of a driver circuit outputting at least two phases (Note that, in the two-line inversion, the polarities of the driving signals are inverted

every frame) where each of the phases periodically violates the dot inversion polarity scheme and the point of violation is selected such that it primarily impacts the at least one column of blue subpixels (by having two same colored subpixels having the same polarity in one column, the vertical crosstalk still occurs and it primarily impacts luminance of the blue color because the blue subpixels are arranged to be adjacent to each other.).

As to **claim 14**, Mori as modified above teaches the method comprising providing a correction signal to one or more subpixels (Note that providing the image signals having the two-line inversion polarity scheme is to correct the image degradation caused by having subpixels having the same polarity all the time).

As to **claim 15**, Mori teaches a liquid crystal display [abstract lines 1-2] comprising:

a display panel [fig. 4, col. 4 lines 1-2, and drawing 1 provided on page 3 of this Office Action] including a plurality of sub-pixels arranged in a sub-pixel repeating group; the subpixel repeating group comprising an even number of subpixels in a row, and including a column of dark colored sub-pixels [drawing 1]; and

means [col. 1 lines 47-52 and col. 12 lines 12-17] for providing driver signals to the sub-pixels in the display panel to send image data.

Mori does not expressly teach the means for providing driver signals to the sub-pixels in the display panel to send image data having a dot inversion polarity scheme.

However, Examiner takes Official Notice that it is well known in the art to use a dot inversion polarity scheme as a driving method of a liquid crystal display.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the means for providing the driver signals to use a dot inversion polarity scheme in order to reduce vertical crosstalk caused by having a plurality of pixels/sub-pixels driven by the same polarity.

Mori as modified above inherently teaches that the image degradation of blue color introduced by the signals is localized on the column of dark colored sub-pixels since any image degradation caused by the dot inversion scheme would degrade the quality of the images to be displayed by all of sub-pixels and thus image degradation related to blue colors would be localized on the column of blue colored sub-pixels, which are dark colored sub-pixels.

As to **claim 16**, Mori teaches the column of dark colored sub-pixels being the column of blue sub-pixels [drawing 1 provided on page 3 of this Office Action].

As to **claim 19**, Mori as modified above teaches the liquid crystal display further comprising means for providing correction signals to one or more sub-pixels in the group of sub-pixels (Note that the driver signals used to send image data having a dot inversion polarity scheme corrects the image degradation caused by a plurality of subpixels having a same polarity).

As to **claim 20**, Mori teaches a liquid crystal display [abstract lines 1-2], comprising:

display means including a plurality of sub-pixels arranged in accordance with a panel tessellating sub-pixel repeating group [drawing 1 provided on page 3 of this Office action], the subpixel repeating group being characterized by an even number of

subpixels in a row and including at least one column of blue sub-pixels (the two blue sub-pixels included in the rectangular box having gray background); and

driving means [col. 1 lines 47-52 and col. 12 lines 12-17] for providing signals for image data to the display means.

Mori does not expressly teach the driving means for providing signals for image data having a non-dot inversion polarity scheme to the display means, wherein the driving means has at least two phases selected such that each of the phases periodically violates a dot inversion polarity scheme and the point of violation is placed substantially upon the at least one column of blue subpixels.

However, Examiner takes Official Notice that it is well known in the art to use a periodic 2-line inversion polarity scheme as a driving method of a liquid crystal display.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the driving means of Mori to provide image data having a periodic two-line inversion polarity scheme in order to reduce vertical crosstalk caused by having a plurality of pixels/sub-pixels driven by the same polarity.

Mori as modified above teaches that the driving means has at least two phases selected (Note that, in the two-line inversion, the polarities of the driving signals are inverted every frame) such that each of the phases periodically violates a dot inversion polarity scheme (Note that any two-line inversion polarity scheme violates the rules of any one-dot inversion polarity scheme) and the point of violation is placed substantially upon the at least one column of blue subpixels (by having two same colored subpixels having the same polarity in one column, the vertical crosstalk still occurs).

As to **claim 21**, Mori as modified above teaches the liquid crystal display comprising means for providing a correction signal to one or more subpixels (Note that providing the image signals having the two-line inversion polarity scheme is to correct the image degradation caused by having subpixels having the same polarity all the time).

As to **claim 25**, Mori as modified above teaches that the use of a driver circuit (Mori: "106") [Mori: fig. 25] comprises providing a plurality of two-phase (Note that, in the two-line inversion, the polarities of the driving signals are inverted every frame) driver chips [Mori: col. 12 lines 15-16] for driving respective bounded sections of the display; wherein phases of each provided driver chip are selected such that parasitic effects placed upon imagery of any of the subpixels driven by the phased signals are placed substantially upon subpixels disposed in columns positioned at a boundary of the bounded display sections respectively driven by the driver chips (Note that Examiner construed the boundary of the bounded display sections as the two or three outmost columns of the subpixels of the display sections.).

As to **claim 26**, all of the claim limitations have already been discussed with respect to the rejection of claim 25.

As to **claim 28**, Mori teaches that the driver circuit sends signals indicating image data having a polarity scheme to the panel such that at least two adjacent subpixels in a row have the same polarity [drawing 2 provided on page 10 of this Office action].

As to **claim 29**, Mori as modified above teaches that the means for providing driver signals includes a plurality of two-phase (Note that, in the two-line inversion, the

polarities of the driving signals are inverted every frame) driver chips [Mori: col. 12 lines 15-16] for sending the driver signals to the display panel; the phases of each driver chip being selected such that scheme violations introduced by the driver signals are placed substantially upon blue subpixels disposed in columns positioned at a boundary between the driver chips (Note that Examiner construed the boundary of the bounded display sections as the two or three outmost columns of the subpixels of the display sections.).

As to **claim 30**, Mori as modified above teaches that the image degradation is caused by same-color subpixels of same polarity occurring successively one after the next [drawing 2 provided on page 10 of this Office action].

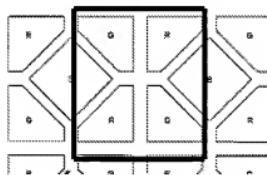
As to **claim 31**, Mori as modified above teaches that the violation tends to cause image degradation due to parasitic effects of parasitic capacitance present in the panel (Note that the vertical cross-talk caused by the vertically arranged sub-pixels having the same polarity is caused by parasitic or stray capacitive effects between a data line and a pixel electrode of the sub-pixels.) (as evidenced by US 5,841,411 col. 1 lines 42-49).

7. **Claims 3-4, 10-11, and 17-18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Mori as applied to claims 1-2, 8-9, 13-16, 19-21, 25-26, and 28-31 above, and further in view of Martin (US 6,714,206).

As to **claim 3**, Mori [drawing 1 provided on page 3 of this Office Action] teaches the sub-pixel repeating group substantially comprising red and green sub-pixels interspersed with two columns of blue sub-pixels.

Mori does not expressly disclose a checkerboard of red and green sub-pixels interspersed with two columns of blue sub-pixels.

However, Martin [drawing 3 provided below, which is same as figure 2 of Martin] teaches an arrangement of having four sub-pixels (the sub-pixels included in the rectangle drawn with solid lines) having two different colors in a checkerboard pattern so that the two sub-pixels having a same color are not adjacent to each other in a horizontal direction and in a vertical direction.



Drawing 3

It would have been obvious to one of ordinary skill in the art at the time of the invention to apply Martin's red and green sub-pixel arrangement in the modified Mori's display, in order to provide an uniform color illumination for a liquid crystal display by placing the four adjacent sub-pixels having two different colors in a pattern such that the two sub-pixels having a same color are not adjacent to each other in a horizontal direction and in a vertical direction.

As to **claim 4**, Mori teaches that for each the subpixel repeating group, the two columns of blue sub-pixels share a same column driver ("source driver 106") [fig. 25] (Note that, in the display of Mori, all sub-pixels share the same column driver.).

As to **claim 10**, all of the claim limitations have already been discussed with respect to the rejection of claim 3.

As to **claim 11**, Mori as modified by Martin teaches that for each subpixel repeating group, the providing driver signals includes providing of scheme violating signals to the two columns of blue subpixels from a same column driver ("source driver 106") [fig. 25].

As to **claim 17**, all of the claim limitations have already been discussed with respect to the rejection of claim 3.

As to **claim 18**, all of the claim limitations have already been discussed with respect to the rejection of claim 11.

8. **Claims 5 and 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Mori as applied to claims 1-2, 8-9, 13-16, 19-21, 25-26, and 28-31 above, and further in view of Francis (US 5,841,411).

As to **claim 5**, Mori does not teach that a correction signal is applied to one or more of the subpixels at which the violation of the periodic dot inversion polarity scheme occurs and the applied a correction signal counters a loss of luminance caused by the violation.

However, Francis teaches the concept of applying a correction signal to one or more subpixels at which a periodic dot inversion polarity scheme does not occur to compensate a loss of the luminance caused by not having the periodic dot inversion [col. 2 lines 29-56] (Note that the vertical cross-talk can be prevented by the periodic dot inversion.).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the liquid crystal display of Mori as modified above to apply a correction signal to one or more subpixels at which the periodic dot inversion polarity scheme does not occur to compensate a loss of the luminance caused by not having the periodic dot inversion, as taught by Francis, in order to reduce the luminance loss caused by the vertical cross-talk.

As to **claim 12**, all of the claim limitations have already been discussed with respect to the rejection of claim 5.

#### ***Conclusion***

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SEOKYUN MOON whose telephone number is

Art Unit: 2629

(571)272-5552. The examiner can normally be reached on Mon - Fri (8:30 a.m. - 5:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

August 6, 2009  
/S. M./  
Examiner, Art Unit 2629

/Amare Mengistu/  
Supervisory Patent Examiner, Art Unit 2629